WILLIAMS

REPEATER

DIRECTORY

OF THE

NORTH CAROLINA

FM REPEATER ASSN. INC.

VOLUME I

SEPTEMBER 1, 1971

PREFACE

This directory is issued annually on September 1, as a convienience to the members of the North Carolina FM Repeater Association Inc. The accuracy of the information contained herein is not guaranteed by the Association.

This directory is not for sale and its contents may not be reproduced without the written consent of the North Carolina FM Repeater Association Inc.

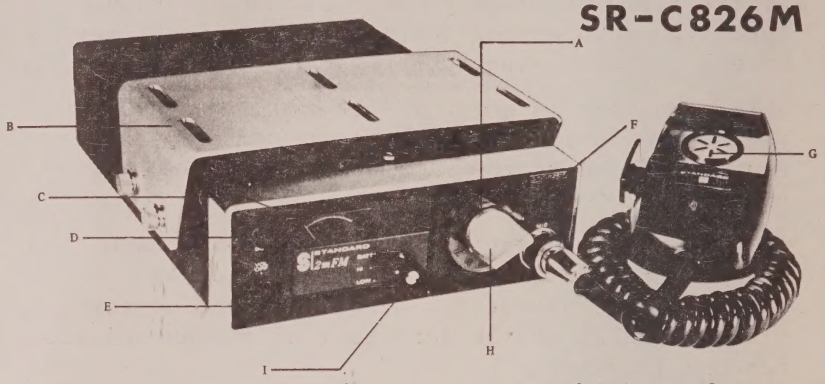
If you have information concerning some phase of FM operation in North Carolina, and you would like to see it included in this directory, please send it to the Secretary of the Association for consideration.

Information planned for publication in the next issue includes ---

- o New repeaters in operation or planned.
- o Special simplex frequencies in use in specific areas of the state.
- o Listing of the Associate Members in the Association.

STANDARD COMMUNICATIONS

SR-C826M



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E. Volume ON-OFF switch
F. Transmitting indicator
G. Microphone
H. Channel selector
I. Function switch

Panel illumination is soft green to blend with instrument panel lighting.

General

Freq. Range — 143 to 149 MHz

12 channels in 2 MHz spread

Supply voltage — 11 to 16 VDC. 13.8VDC nominal

Current consumption — .15 amp receive standby. 2.4 amp transmit

Polarity of supply voltage — Negative ground

Number of channels — 12-Supplied with 4 channels

1) 146.94 MHz Tx and Rx (national calling channel)
2) 146.34 Tx — 146.76 Rx (repeater channel)
3) 146.76 Tx — 146.76 Rx (simplex channel)
4) 146.34 Tx — 146.94 Rx (repeater channel)

Microphone — Dynamic type with retractable neopreme cord

Dimensions — 6⅞"w x 2½"h x 9⅞"d

Weight — 4½ lbs. max.

Frequency stability — .001% (−10 to +60°C)

Transmitter

RF power output — .8 or 10 watts

Audio response — +1 −3 dB of 6 dB/octive pre-emphasis

Output impedance — 50 ohms nominal

Deviation — Internally adjustable to ±10 kHz min. factory set to ±7 kHz

Spurious and harmonic attenuation — 50 dB below the carrier power level

Audio roll off above 3 kHz — 16 dB/octive

Type of modulator — Phase

FOR MORE DETAILS, WRITE YOUR VHF SPECIALIST

Carl Eagle Electronics
Box 585
Granite Quarry, N.C.
28072

Receiver

Sensitivity — .4 or less microvolts for 20dB quieting

Squelch sensitivity — Threshold — .2 microvolts or less

Maximum (tight) — Between 20 dB quieting sensitivity and 20 dB quieting plus 10 dB

Deviation acceptance — Up to ±15 kHz deviation

Spurious and image attenuation — 65 dB below the desired signal threshold sensitivity

Adjacent channel selectivity (30 kHz channels) — 60 dB attenuation of adjacent channel

Type of receiver — Dual conversion superheterodyne

Audio output — 5 watts minimum*

Audio distortion — 10% maximum* at 3 watt output

*with external speaker

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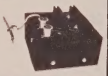

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NORTH CAROLINA FM REPEATER ASSOCIATION INC.

On March 14, 1971, a large group of North Carolina amateur repeater owners and repeater club representatives met in Greensboro to determine if interest existed within the state to form some type of state wide organization to represent the "new FM Repeater interests". Representatives from most of the active repeaters within the state were present at the session. The decision to form the North Carolina FM Repeater Association Inc. was unanimous.

On April 18, again in Greensboro, the Association was formally created, and a seven member Board of Directors was elected.

The basic purposes of the Association are: (1) to promote the exchange of information concerning repeater installation and operation among the amateurs of North Carolina, (2) offer guidance and assistance in establishing repeaters in the state, (3) provide a unified voice for VHF FM interests in N. C. to the FCC and other groups, and (4) advance the general interest and welfare of amateur radio as a public service.

Two classes of membership are available:

(1) Full Members - these are the individuals or clubs that own and operate repeaters that service N. C. Each repeater owner (whether it be an individual or club) is allowed two representatives, and one vote, toward directing the progress of the Association. These representatives elect a seven member Board of Directors annually to functionally operate the Association. Annual dues for Full Members is $ 6.00. Charter Membership which will be available until September 15, 1971 is $ 25.00.

(2) Associate Members - these are individual amateurs interested and/or active in VHF FM operations. Associate Members will receive a revised edition of the Repeater Directory annually, plus four quarterly Newsletters. These newsletters will keep the membership informed of organizational activities, FCC rulemaking, and what's happening around the state. Annual dues are $ 2.00. Additionally, one general membership meeting will be held each year, normally associated with a hamfest or ARRL Convention. Special FM programs will be conducted at these meetings.

Only through a united effort on the part of individual repeater owners and clubs will the goals and aspirations of the North Carolina FM Repeater Association be realized. If you or your club currently operate a repeater, or if you have definite plans for placing one into service, and you would like to become a part of this Association, please write for a repeater membership application.

The Association has the potential for becoming the largest single organized voice for amateur radio in the state of North Carolina.... we would certainly like to have you contribute to this voice.

Bill Parris, K4GHR
Sec/Treas. NC FM Rptr Assn
Rt 6 Box 605
Salisbury, N. C. 28144

PLAIN TALK ABOUT REPEATERS

What is a repeater?

A repeater is a combination of a receiver and a transmitter, each tuned to separate frequencies, and interconnected by a carrier operated relay and certain other linkages. The repeater is able to receive a signal on one frequency and retransmit it on a second frequency at the same time.

Normally, repeaters are located at high elevations, such as on mountain tops or high buildings, and serve to extend the communications range beyond the normalcapabilities of the typical VHF station.

Stations most often requiring the capabilities of the repeater are mobile or portable units communicating with other mobiles, portables or base stations. Using a repeater, a low powered mobile or hand carried walkie talkie can communicate with similar stations over ranges of 20 to 60 miles.

There are 17 active repeaters in North Carolina at the present time, serving all major metropolitan areas. Some of these repeaters are owned and operated by individual amateurs, others by organized groups or clubs.

Operating through a repeater offers a new experience in amateur radio -- so how about it?

How do I call into a repeater?

There is no established standard for announcing your presence through a repeater. But there are several accepted means and we will review them here. However, before we start, there are several things which you must know about repeaters.

1. Long calls into repeaters are completely unnecessary, and should be avoided.

2. Repeaters are equipped with automatic logging recorders that tape a specified lenght of time during a transmission - you are obligated to find out what this time period is and identify your station so it will get on the log. This requirement is being

reviewed by the FCC but it is a requirement at this time.

3. Most repeaters are equipped with a timer which will shut the repeater down if an input signal holds the receiver open (or the transmitter on) for more than a pre set time period. Most repeaters in North Carolina have 3 minute timers in use.

4. Some repeaters have automatic identifiers - either voice or CW - while others require that the using station identify not only himself, but the repeater too.

5. All repeaters are equipped with remote control mechanisms whereby several "Control Stations" can turn the unit off and on from some remote locations.

6. Most repeaters have an automatic clock timer that turns the repeater on and shuts it off at pre set times.

7. Repeaters should be used for communication where simplex operation is not satisfactory. This is usually the case for portable and mobile stations.

8. Breaking stations should be recognized immediately, in the event they have emergency traffic. Stations in QSO should allow sufficient time between successive transmissions to allow other stations to break in.

9. When making calls - you should announce the frequency on which you are listening. If you are getting into a repeater - which you did not know about - then someone can get on your frequency and tell you; or he may alert you to the fact that there is a repeater on some other frequency.

10. Remember - you are using someone else's equipment. The repeater represents someone's hard work, money, and license. So adhere to all regulations, and do not over extend your privileges.

Now - how about those procedures? Assume your call is WA4XXX, and the repeater you are operating through is K4OK which has an input frequency of 146.34 mhz. and an output frequency of 146.94 mhz. The time is 1830 local time. Let's go .....

a. You wish to announce that you are on frequency and ready to enter into QSO with any station. You should announce:

" 1830, this is WA4XXX on 34/94"

b. You wish to call W4BO- an old friend who abandoned 3938 when you did. You should say:

" 1830, W4BO this is WA4XXX on 34/94"

c. You wish to break into a QSO in progress. Here is the sequence:

" Break" (as soon as you say "break", everyone should pause and let the repeater drop out - when this happens you say:)
" 1830, this is WA4XXX"

d. You wish to sign out of the repeater after you have had your fun - drop your signal, to allow the repeater input to clear, then announce:

"1830, WA4XXX clear through K4OK"

e. What should you do if the repeater "times out" while you are talking? Of course you will not know this as long as you talk - but when you stop and drop your signal, you will not hear the repeater squelch -- nor will the other station answer you. So .... wait 5 seconds, re-key the repeater and resume the contact. The other stations meanwhile sit patiently and wait - they should not be trying to re-key the repeater -- for only you will know when the right time to re-key has arrived. For after all it was you that timed it out.

Notice that the time and your call are announced so they can get into the automatic taped log. Everything is short and sweet. And by the way- use local time, not GMT.

Asheville

WA4NUO

INPUT: 146.34 mhz.
OUTPUT: 146.94 mhz.*

HOURS OF OPERATION:
In development stage
Plan for 24 hours

This repeater is still in the development stages and firm coverage areas have not been established. The unit currently serves mobiles in Buncombe County without difficulty.

WA4NUO currently is operating this repeater from his home QTH. The unit consists of a Motorola T-416 transmitter and Motorola receiver with a nuvistor pre amp. The antenna system consists of two Hy Gain 5/8 wavelength ground planes.

The ultimate location of the repeater is still unknown at this time but consideration is being given to the top of the Buncombe County Court House, a 15 story building in the downtown area of Asheville.

This repeater is owned and operated by WA4NUO. The Buncombe County Amateur Radio Club may become the sponsor in the near future.

Trustee: Ralph W. Roberts, WA4NUO, Rt 1 Box 284, Alexander, N. C. 28701

Questions concerning this repeater may be directed to the Trustee.

* This repeater operates on 146.76 mhz. sometimes.

Beulaville

WA4UMH

INPUT: 146.34 mhz.
OUTPUT: 146.94 mhz.

HOURS OF OPERATION:
0600 - 2330 local

Mobile coverage is consistent in these counties:
Duplin and Onslow in North Carolina.

Base stations from Goldsboro, Kinston, Jacksonville, Havlock, Smithfield and other surrounding towns easily access this repeater.

WA4UMH began operation from Beulaville in the Spring of 1970. The repeater consists of Motorola equipment with an amplifier rediating 80 watts output. The receiver and transmitter are at separate sites one mile apart and interconnected via wire. The receiver and its 6 db gain antenna are located at 150' on a water tower. The transmitter and a similar antenna at 75' are at the QTH of WA4UMH.

Repeater control is via commercial telephone lines. The repeater is open to all users - no tone required.

Users are asked to identify themselves, the repeater, and give the time when first keying the unit - again every 10 minutes - and at the end of each contact.

The repeater is down for modifications at the date of issue of this directory - but will be back into service in mid September 1971.

This unit is privately owned and operated by:
Donald R. Brown, WA4UMH
Box 361
Beulaville, N. C. 28578

Charlotte

W4BFB

INPUT: 146.34 mhz.
OUTPUT: 146.94 mhz.

HOURS OF OPERATION:
0600 - 2400 local

Mobile coverage is consistent in these counties: Mecklenburg, and parts of Union, Cabarrus, Gaston, Lincoln in North Carolina; and York in South Carolina.

Base stations from Gastonia, Rock Hill, Shelby, Monroe and other surrounding towns easily access this repeater.

W4BFB bagan operation from Charlotte in February 1969. The repeater consists of General Electric "Progress Line" equipment with an output power of 25 watts. The antenna system consists of a Sinclair diplexer and a DB Products 6 db omni antenna.

The repeater is located in the elevator room on the top floor of the North Carolina National Bank building in downtown Charlotte. Antenna height is 1180 feet above mean sea level, and 270 feet above the coverage area. Repeater control is via commercial telephone lines. The unit is open to all users- no tone required.

An automatic logging device records tne first 20 seconds of each transmission. The repeater uses a 3 minute transmission timer which resets each time the input frequency is cleared. An automatic CW identifier provides the ID requirements.

This repeater is a Charter Member of the North Carolina FM Repeater Association Inc. and is sponsored by the Mecklenburg Amateur Radio Society.

Questions concerning this repeater may be directed to Roland Kunkel, W4URS, 4014 Rhodes Ave., Charlotte, N. C. 28210.

Durham

No Call Yet

INPUT: 444.25 mhz.
OUTPUT: 449.10 mhz.

HOURS OF OPERATION:
24 hours

The Durham FM Association is in the construction and testing phases of this touchtone autopatch repeater which will service the Durham and Chapel Hill areas. This repeater should be in operation during the Fall of 1971.

The repeater site is on a watertower near I-85 in the northern section of Durham. The 9 db gain antennas will be 150' above the surrounding terrain. Repeater control will be via radio on 450 mhz. The unit will be open to all users.

An automatic tape logging system will record the first 10 seconds of each transmission.

This repeater is a Charter Member of the North Carolina FM Repeater Assn. Trustee is Charles Durst, WA4WTX, 1200 Leon St., Durham, N. C. 27705.

Chapel Hill

K4RSH

INPUT: 146.16 mhz. 146.22 mhz. 146.31 mhz.
OUTPUT: 146.76 mhz. 146.82 mhz. 146.91 mhz.

K4RSH will have this repeater fully operational in mid September 1971. The repeater consists of a Dycom, 4 channel scanning unit, with an output power of 10 watts. The antenna system is two 6 db antennas.

The site is on a nearby peak which is 720 feet above mean sea level and 300 feet above the surrounding terrain. The unit is open to all users - no tone required. A Hal Devices identifier will ID the repeater on CW. Repeater control will be on 450 mhz.

The repeater will operate on 16/76 initially and later be set to scan the receiving and transmitting frequencies listed above. Unit is owned and operated by Charles Blair, K4RSH, 16 Angier, Chapel Hill.

Durham

K4RUQ

INPUT: 146.34 mhz.
OUTPUT: 146.94 mhz.

HOURS OF OPERATION:
0600 - 0200 local

Mobile coverage is consistent in these counties: Wake, Durham, Orange and Chatham in North Carolina.

Base stations from Burlington, Danville, Greensboro, Smithfield, Raleigh, Hendersonville and other surrounding towns easily access this repeater.

K4RUQ began operating from Durham in September 1969. Power output is 100 watts.

This repeater is a split site unit - there are two receiver sites, one in downtown Durham and the other at the QTH of K4RUQ. The transmitter, which feeds a 6 db omni J-Pole, is located on a 750' peak 10 miles north of Durham. This places the transmitting antenna 300' above the repeater coverage area.

Repeater control is via radio on 450 mhz. The repeater is open to all users - a 1682 cycle tone or whistle is needed to key up the repeater.

K4RUQ has an autopatch under construction - touch-tone pad will be required. Repeater output will change from 146.94 to 146.76 for autopatch only. The unit will revert back to 146.94 30 seconds after autopatch is completed.

This repeater is a Charter Member of the North Carolina FM Repeater Association Inc. and is owned and operated by K4RUQ.

Trustee: Bill Sims, K4RUQ, 1337 Clermont Dr., Durham, N. C. 27707

Danville

WB4QEP

INPUT: 146.28 mhz.
OUTPUT: 146.88 mhz.

HOURS OF OPERATION:
0600 - 2400 local

Mobile coverage is consistent in these counties: Pittsylvania, Henry & Halifax in Virginia; Caswell, Guilford, & Rockingham in North Carolina.

Base stations from Martinsville, Roanoke, Lynchburg, Greensboro and other surrounding towns easily access this repeater.

WB4QEP began operation from White Oak Mountain, 10 miles north of Danville, in May 1971. The unit consists of RCA equipment and has an output power of 45 watts. The antenna system consists of a DB 4003 diplexer with a Hy Gain J-Pole as a receiving antenna and a Hy Gain 3 db colinear as a transmitting antenna. The antennas are spaced 24 feet apart on a 100' tower.

The site is 1200 feet above mean sea level and 600 feet above the surrounding terrain. Repeater control is via radio on 450 mhz. The repeater is open to all users - no tone required.

The repeater uses a 3 minute transmission limiting timer. Identification is via a CW identifier. Logging is on tape - to sign out, give the time and your call after the carrier drops 2 seconds.

This unit is a Charter Member of the North Carolina FM Repeater Association Inc. and is sponsored by the Danville Repeater Club.

Trustee: Amos R. Rhames, K4WQS, 214 Bailey Place, Danville, Va. 24541

Questions concerning this repeater may be directed to the trustee.

Elizabeth City

WA4VTX

INPUT: 146.28 mhz. 146.94 mhz* HOURS OF OPERATION:
OUTPUT: 146.88 mhz. 146.88 mhz 24 hours

Mobile coverage is consistent in these counties: Pasquotank, Camden, Currituck, Chowan, Perquimans, Gates and parts of Dare Hyde and Tyrrell in North Carolina; The greater Norfolk, Virginia Beach and Chesapeake areas of Virginia.

Base stations from the Pamlico Sound area of North Carolina to the Chesapeake Bay area in Virginia easily access this repeater.

WA4VTX began operation from Elizabeth City in 1967, operating on 146.34 and 146.94. The repeater consists of General Electric "Progress Line" equipment with an output power of 60 watts. The receiving antenna is a 9 db gain omni homebrew coax ½ wave, transposed in PVC pipe mounted with the top at 250' on the east side of a 300' tower. The transmitting antenna is on the same tower at the 200' level. The receiving antenna line incorporates the use of a GE cavity.

The tower location is 2 miles west of Elizabeth City on rural road 1309. Elevation of the site is 17 feet above mean sea level. Repeater control is local at the site.

A manual phone patch to a two party fone line is available at the site-- this will be regraded to a private line in early 1972 whereupon the touchtone autopatch system will be activated. The logging recorder runs the first 15 seconds of transmitter air time. Users are requested to insert the time when identifying.

This unit is sponsored by the Pasquotank Amateur Radio Klub.

Trustee: Albert E. Onley, K4VHV
Direct questions and correspondence to:
Joseph B. Stevens, WA4JZX
704 W. Main St.
Elizabeth City, N. C. 27909

* Touchtone transmitted on 146.28 activates the 146.94 input.

Greensboro

WB4OFF

INPUT: 146.16 mhz.
OUTPUT: 146.76 mhz.

HOURS OF OPERATION:
24 hours

Mobile coverage is consistent in these counties: Guilford and parts of Randolph, Davidson, Forsyth, and Alamance in North Carolina.

Base stations from High Point, Winston-Salem, Lexington, Burlington and other surrounding towns easily access this repeater.

The Greensboro repeater has operated experimentally since June 1971 as W4GG. In August 1971 the unit was moved to the QTH of WB4OFF where it is now in full operation.

The repeater consists of Motorola equipment with an output power of 60 watts. The antenna system consists of a diplexer and a "Ringo" antenna for both transmitting and receiving.

The site is 980' above mean sea level and 80' above the surrounding terrain. Repeater control is local at the site. The unit is open to all users - no tone required.

The repeater incorporates an automatic 12 second logging recorder.

This repeater is a Charter Member of the North Carolina FM Repeater Association Inc. and is affiliated with the Greensboro Radio Club Inc.

Trustee: Bill Ingram, WB4OFF, 3903 Broadacres Dr., Greensboro, N. C. 27407

Questions concerning this repeater may be directed to the Trustee.

High Point

K4VUG

INPUT: 146.34 mhz 146.20 mhz* HOURS OF OPERATION:
OUTPUT: 146.94 mhz 146.98 mhz* 24 hours

Mobile coverage is consistent in these counties: Davidson, Guilford, and parts of Forsyth, and R Randolph in North Carolina.

Base stations from Greensboro, Winston-Salem, Asheboro, Burlington, Salisbury, Lexington, Mocksville, and other surrounding towns easily access this unit.

K4VUG began operation from High Point in January 1969. The unit consists of Motorola equipment with an output of 250 watts. The two Hy Gain 3 db antennas are spaced 300' apart - horizontally.

The repeater is located at the QTH of K4AZA, north of High Point off Highway 311. Site elevation is 1000 feet above mean sea level and 100 feet above the surrounding terrain. Repeater control is via commercial telephone lines. The unit is open to all users - no tone required.

An automatic tape logging system records the first 7 seconds of each transmission for the using station to identify. Users should drop the carrier before logging out. Repeater identification is on voice tape at present, but a CW identifier is under construction.

Satellite receivers are currently under construction for K4VUG in Greensboro, Lexington (in use now part time), and Asheboro. Another possible satellite receiver location in High Point on a tower at the 600' level is currently being investigated.

An autopatch system is in use part time - details can be obtained from the trustee.

Trustee: F. L. Warford, K4AZA, 121 Old Mill Road, High Point, N. C. 27260

Questions concerning this repeater can be directed to the Trustee.

K4VUG is a Charter Member of the North Carolina FM Repeater Association Inc. and is privately owned by K4AZA. The High Point Repeater Association assists in maintaining the repeater operational.

Lexington

W4PAR

INPUT: 146.31 mhz.
OUTPUT: 146.91 mhz.

HOURS OF OPERATION:
0600 - 0100 local

Mobile coverage consistent in these counties:
Davidson and adjoining parts of Rowan, Davie and Randolph in North Carolina.

Base stations from Winston-Salem, High Point, and Salisbury easily access this repeater.

W4PAR began operation in June 1971 and is currently located at the QTH of WA4JVD near Linwood, N. C. south-east of Lexington. The repeater consists of a Motorola Sensicon G receiver and a Motorola "Motrac" transmitter, with a power output of 25 watts. The antenna system is two 3 db ground planes with 20 foot vertical spacing.

The site is 750 feet above mean sea level and 75 feet above the surrounding terrain. Repeater control is via commercial telephone lines. The unit is open to all users - no tone required.

An automatic tape logging system logs the first 15 seconds of each transmission. Users are asked to identify the repeater as there is no automatic ID at this time - one is planned in the near future. The unit uses a 3 minute transmission limiting timer which resets when the transmitter goes off and the input frequency is cleared.

This unit is a Charter Member of the North Carolina FM Repeater Association, Inc. and is sponsored by the Lexington FM Association.

Trustee: W4WAU, Raeford Everhart

Direct questions concerning this repeater to:

Larry F. Sharpe, WA4JVD
Rt 1 Box 414
Linwood, N. C. 27299

or

Jerry Everhart, K4FMC
Rt 6 Becks Church Rd.
Lexington, N. C. 27292

North Wilkesboro

W4DCD

INPUT: 52.780 mhz. 146.420 mhz. 52.525 mhz.
OUTPUT: 52.525 mhz. 52.525 mhz. 146.050 mhz.

W4DCD repeater site is on Potter's Peak, near North Wilkesboro. This repeater serves the entire west central area of North Carolina. This unit is linked to the WA4EHL repeater in Raleigh, which operates on the same input and output frequencies. This repeater is owned and operated by Malcolm Holt, W4DCD, 404 College St., Wilkesboro, N. C.

Mt. Pisgah

WA4BVW

INPUT: 146.16 mhz.
OUTPUT: 146.76 mhz.

HOURS OF OPERATION:
To be announced

This repeater is in the construction and testing phase. It is privately owned and operated by Ken Woodard, WA4BVW, RFD 2, Canton, N. C.

Mt. Pisgah, 18 miles southwest of Asheville, is approximately 4700 feet above sea level.

Raleigh

K4ITL

INPUT: 146.28 mhz
OUTPUT: 146.88 mhz

HOURS OF OPERATION:
Unknown

K4ITL began operation of this repeater in July 1971. The unit has a power output of 100 watts. The receiving antenna is a "Ringo" and transmitting antenna is a 6 db J-Pole. This repeater is owned and operated by Danny Hampton, K4ITL.

Raleigh

WA4EHL

INPUT: 52.780 mhz. 146.420 mhz. 52.525 mhz.
OUTPUT: 52.525 mhz. 52.525 mhz. 146.050 mhz.

WA4EHL is in the initial phases of operation at this time. This repeater is linked to the W4DCD repeater in North Wilkesboro - both units have identical input and output frequencies. This unit should provide mobile coverage to the entire east central area of North Carolina.

Roaring Gap

WB4PPS

INPUT: 146.22 mhz 146.94 mhz HOURS OF OPERATION:
OUTPUT: 146.94 mhz 145.50 mhz 0700 - 0100 local

Mobile coverage is consistent in these counties: Wilkes, Surry, Alleghany, Yadkin, Alexander, Iredell, and Davie in North Carolina.

Base stations from cities and towns in North Carolina and Southern Virginia within 75 miles of the repeater site easily access this unit.

WB4PPS began operation from Roaring Gap, 20 miles north of North Wilkesboro, near the Blue Ridge Parkway, in August 1970. The repeater of Motorola "Sensicon" units and has a power output of 30 watts. The two antennas are separated 150' horizontally. The receiving antenna is a "Ringo" and the transmitting antenna is a DB 224.

The site is 2960 feet above mean sea level and 2000 feet above the average elevation of the surrounding coverage area. The repeater is located on the skeet shooting range of the Roaring Gap Club. Repeater control is via radio. The unit is open to all users - no tone required.

The repeater uses a 3 minute transmission limiting timer which resets instantly after accessing carrier is dropped. A CW identifier identifies the unit upon release of the accessing carrier. If the repeater is timed out, it will still identify upon release of the accessing carrier. Logging is the user's responsibility - there is no automatic equipment in use at this time.

This unit is a Charter Member of the North Carolina FM Repeater Association Inc. and is sponsored by the Blue Ridge Amateur Radio Association.

Trustee: Steve Kelly, WB4PPS, McElwee St.,
North Wilkesboro, N. C. 28659

Direct questions concerning the repeater to:
Michael G. Warren, WB4QCY, Rt 5,
North Wilkesboro, N. C. 28659

Salisbury

W4EXU

INPUT: 146.28 mhz.
OUTPUT: 146.88 mhz.

HOURS OF OPERATION:
0600 - 2400 local

Mobile coverage is consistent in these counties:
Rowan, Davie, and parts of Iredell, Cabarrus, Davidson, Stanly & Forsyth in North Carolina.

Base stations from Winston-Salem, Charlotte, Greensboro, Albemarle and other surrounding towns easily access this repeater.

W4EXU began operation from Young's Mountain, 10 miles west of Salisbury, in June 1971. The unit is a commercial Motorola "Motrac" repeater and has an output power of 25 watts. The two 3 db Mosely ground plane antennas are situated on an 80' tower, with the receiving antenna at 80' and transmitting antenna at 60'.

The site is 1100 feet above mean sea level and 200 feet above the surrounding terrain. Repeater control is via commercial telephone lines. The unit is open to all users - no tone required.

An automatic tape logging system records for 15 seconds each time the transmitter is keyed - during this period the using station should identify his call and give the time. The unit uses a 3 minute transmission limiting timer which resets each time the receiver squelch is released. The CW identifier identifies the repeater 5 seconds after the receiver squelch is opened.

This unit is a Charter Member of the North Carolina FM Repeater Association Inc. and is sponsored by the Rowan Amateur Radio Society.

Trustee: Barney S. Dodd, W4BNU, 420 W. Franklin St., Salisbury, N. C. 28144

Direct questions concerning this repeater to:

Bill Parris, K4GHR
Rt 6 Box 605
Salisbury, N. C. 28144

or

Fred Ostwalt, K4EYF
1316 Forestdale Dr.
Salisbury, N. C. 28144

Shelby

W4NYR

INPUT: 146.28 mhz. HOURS OF OPERATION:
OUTPUT: 146.88 mhz. 0700 - 0100 local

Mobile coverage is consistent in these counties: Cleveland, Gaston, and Rutherford in North Carolina; Cherokee in South Carolina.

Base stations from Charlotte, Lincolnton, Forest City, Gastonia, Gaffney, Spartenburg and other surrounding towns easily access this repeater.

W4NYR began operation in June 1971. The repeater site is Whitaker Mountain, located 10 miles south of Shelby near Interstate 85, in Cherokee County in South Carolina. The unit is a commercial Motorola "Sensicon" repeater and has an output power of 30 watts. The antenna system consists of a DB 4024 diplexer with a Hy Gain J-Pole antenna on an 80' tower.

The site is 1300 feet above mean sea level and 400 feet above th surrounding terrain. Repeater control is via radio on 450 mhz. The repeater is open to all users - no tone requierd.

The repeater uses a 3 minute transmission limiting timer and is identified via a CW identifier.

This unit is a Charter Member of the North Carolina FM Repeater Association Inc. and is sponsored by the Shelby Radio Club Inc.

Trustee: Malcolm Spangler, K4KUT, 509 Suttle St, Shelby, N. C. 28150

Questions concerning this repeater should be directed to:

Joe Cherry, WA4AGR
P. O. Box 1005
Shelby, N. C. 28150

NORTH CAROLINA FM REPEATER ASSOCIATION INC.

Full Members

9 - 1 - 71

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* Indicates member of Board of Directors

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TWO METER FM TRANSCEIVER

FM-2X

General

- **Frequency Coverage:** 144-148 MHz
- **Number of Channels:** 12 Channels, 3 supplied.
  Channel 1 146.94/146.94
  Channel 2 146.34/146.94
  Channel 3 146.34/146.76
- **Modulation:** Frequency Modulation
- **Transmitter Control:** Push to talk.
- **Power Source:** AC: 117 volts 50/60 Hz
  DC: 13.5 Volts ±10%
  Dimensions: 8¼" x 7" x 3"
- **Weight:** 8¼ lbs.

Transmitter

- **FULLY SOLID STATE, NO TUBES.**
- **RF Output Power:** 10 watts minimum.
- **Frequency Deviation:** 15 KHz maximum.
- **Frequency Stability:** ±.001% or less.
- **Spurious Radiation:** Greater than −60 db below Carrier.
- **Frequency Multiplication:** 12

Receiver

- **Receiver Circuit:** Crystal-controlled Double Conversion Superheterodyne.
- **Intermediate Frequencies:** 1st 10.7 MHz, 2nd 455 kHz.
- **Input Impedance:** 50 to 75 Ohms.
- **Sensitivity** 5μV for 20 db quieting. .5μV for 12 db SINAD.
- **Intermodulation:** Greater than 60 db.
- **Audio Output:** 2 watts to internal speaker.

VHF FM TRANSCEIVER FOR 2 METERS

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NORTH CAROLINA

REPEATER SUMMARY

LOCATION	CALL	INPUT	OUTPUT
Asheville	WA4NUO	146.34	146.94
Beulaville	WA4UMH	146.34	146.94
Chapel Hill	K4RSH	146.16	146.76
Charlotte	W4BFB	146.34	146.94 *
Danville (Va.)	WB4QEP	146.28	146.88 *
Durham	K4RUQ	146.34	146.94 *
Durham	(Unassigned)	444.25	449.10 *
Elizabeth City	WA4VTX	146.28	146.88
Greensboro	WB4OFF	146.16	146.76 *
High Point	K4VUG	146.34	146.94 *
Lexington	W4PAR	146.31	146.91 *
Mt. Pisgah	WA4BVW	146.16	146.76
North Wilkesboro	W4DCD	52.780	52.525
Raleigh	WA4EHL	146.420 52.525	52.525 146.050
Raleigh	K4ITL	146.28	146.88
Roaring Gap	WB4PPS	146.22	146.94 *
Salisbury	W4EXU	146.28	146.88 *
Shelby	W4NYR	146.28	146.88 *

* Member N. C. FM Repeater Assn. Inc.